II. The Cascade Mountains Area

The Cascade Mountain Area of the Rogue River – Siskiyou National Forest Roads Analysis is that area of the Rogue River National Forest from the northern most portion of the Forest, along the Umpqua River and Rogue River watershed divide south, to the Howard Prairie Lake area, a few miles north of State Highway 66. This covers the Prospect Ranger District, Butte Falls Ranger District, and the northeastern portion of the Ashland Ranger District.

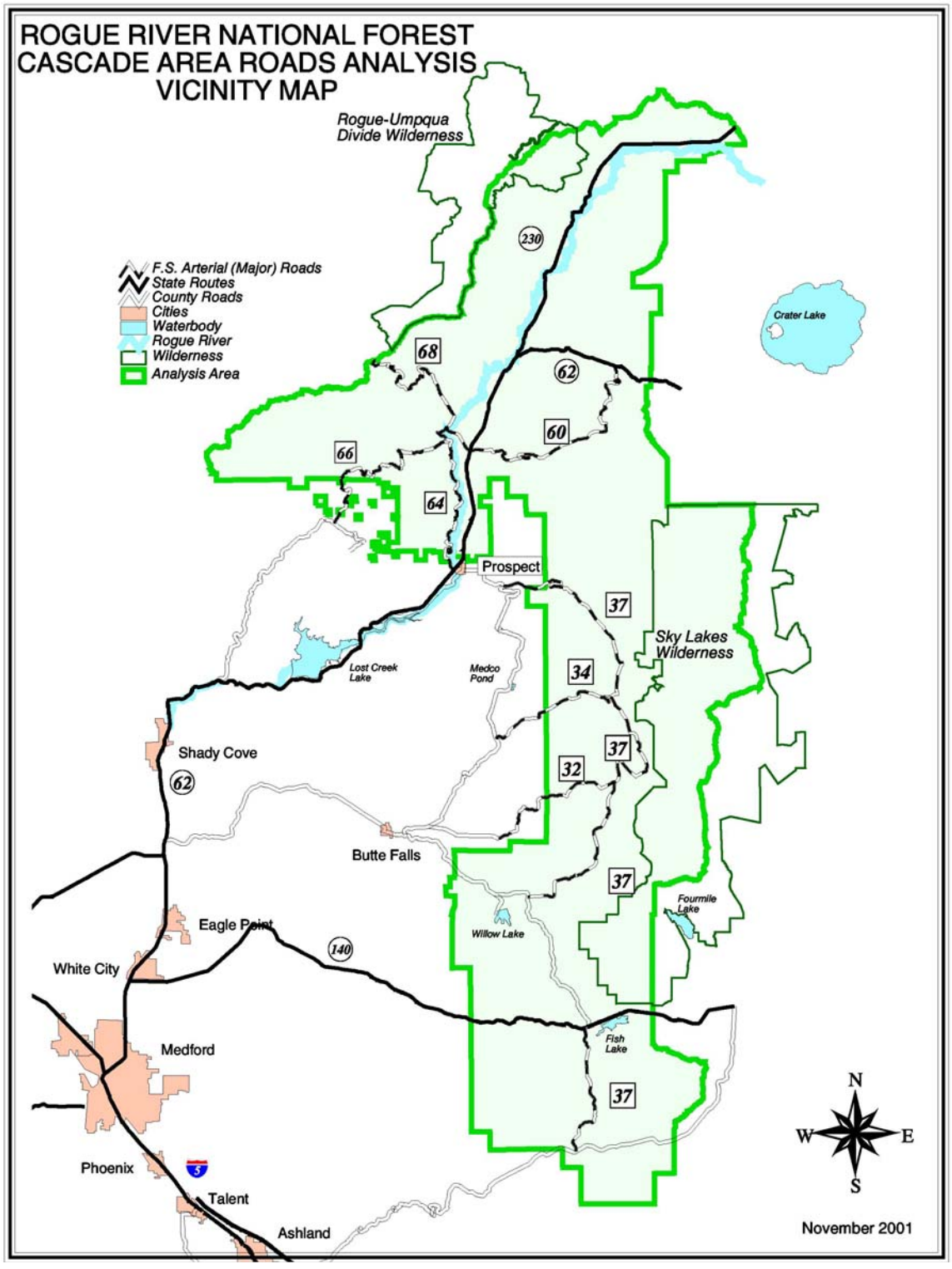
This is a logical analysis area for the Forest Road System since there is a wide break (approximately 15 miles) in Forest Service managed lands to the Siskiyou Mountain area south of the City of Ashland, Oregon (see Map II-1).

A. Background and Historical Content

Long before 1850, when Euro-Americans first began to settle in the Rogue River drainage, the native people had established trails into and across the Cascade Range, or Cascade Mountains. Some of these "Indian trails" closely paralleled major streams; others, particularly at the higher and more rugged elevations, tended to follow along the crests of major ridges. Two important trans-Cascade native trails included the "Rancheria Trail" (passing over the north slope of Mt. McLoughlin) and the Union Creek/Annie Creek trail (which branched east and then southeast from the upper Rogue River to the Upper Klamath Lake vicinity). Such foot-trails facilitated seasonal hunting, late-summer huckleberry gathering, and trading or other inter-group activities including warfare. Because of the deep snow that accumulated in the mountains, these routes were used mainly between June and October. In the late 1840s, the "Applegate Trail" (a southern route of the Oregon Trail) began bringing settlers from the east across the relatively gentle summit of the Cascades, and then on north through the Rogue River drainage to the Willamette Valley; this route passed entirely outside and south of the present-day Rogue River National Forest, approximately following the path of today's "Green Springs Highway" (Oregon Highway 66).

During the early/mid-1860s, the portion of the Rogue River National Forest that lies within the Cascade Range was the first portion of the Forest to be crossed by Rogue Valley settlers' wagon roads. There are two major reasons for this: 1) The Southern Cascade Range tends to be comparatively gentle in relief, as opposed to the extremely rugged Siskiyou Mountains. 2) Beyond the summit of the Cascade Range the lush rangelands of the upper Klamath Basin, and the booming new mining communities further to the east (e.g. the "John Day" gold mines of central Oregon, the "Boise Basin" mines of southwest Idaho) proved attractive to local stockmen and merchants. The 1863 establishment of the Klamath Indian Reservation, and Fort Klamath, just over the mountains required ongoing supply and staffing from the nearest major towns, Jacksonville and Ashland. Today, no less than three major state highways cross this portion of the National Forest, reflecting the continuing importance of east/west, trans-Cascadian transportation.

MAP II-1. Cascade Mountains Area - Vicinity Map



The first wagons to cross the summit of the southern Cascades within what is now the Rogue River National Forest followed the Rancheria Trail. This 1863 wagon route became the first "Ft. Klamath-Jacksonville Military Road", but due to the deep snow pack on Mt. McLoughlin's north flank it was rarely passable until well into July. A second military wagon route, laid out in 1864 by soldiers from Ft. Klamath, followed the Union Creek/Annie Creek route, descending into the Rogue Valley via gentler sections of the Rogue River, and lower portions of the Big Butte Creek and Little Butte Creek drainages.

Traveling through what is now the Rogue River National Forest, this wagon route closely paralleled the present-day Crater Lake Highway/Oregon Highway 62. With the increasing tourist travel to Crater Lake by the 1880s, it became well known as the "Crater Lake Road".

The 1860s "John Day Trail" branched off of the Crater Lake Road near Farewell Bend, linking the Rogue Valley with the new gold mines of Oregon's Blue Mountains. Continuing on through the National Forest, this route generally paralleled the present-day Diamond Lake Highway (Oregon Highway 230), however, it kept to the east and south sides of the upper Rogue River before passing along the north shore of tiny Lake West, and crossing the Rogue River near Boundary Springs. The "Dead Indian Road" (recently renamed Dead Indian Memorial Highway) began during the late 1850s as a settler-built route into the nearby mountains from Ashland, but it apparently did not penetrate east beyond Deadwood Prairie and over the Cascade summit to the Klamath Basin until about 1870.

Due to winter snow pack, these four trans-Cascadian roads carried wagon traffic during the summer and early fall only. Branching off from them to the north and south was a network of horse trails that accessed various meadows, springs, and other natural features located in the mountains west of the Cascade summit. Such trails were built and maintained by local stockmen and hunters throughout the late nineteenth century, and doubtless became the major Forest roads of today. The extremely rugged terrain of the upper North Fork-Little Butte Creek canyon, and the "impassable" Brown Mountain lava field between Fish Lake and Lake of the Woods, kept that seemingly "natural route" over the Cascades from being used by all but a very few hardy settlers on horseback. By shortly after the turn of the century, the growing numbers of Rogue Valley berry-pickers and health-seekers led to the construction of very crude wagon roads to the summit of Huckleberry Mountain, and up the South Fork-Little Butte Creek canyon to the "Dead Indian Soda Springs," respectively.

The USDA Forest Service began administration of the Crater National Forest (now Rogue River National Forest) shortly after 1905. The agency's initial transportation-improvement work focused on construction of miles of simple horse-packing trails throughout the Cascades, which were primarily for fire-fighting access. However, in 1907 Forest Service crews did build an extremely crude "road" that started near Prospect, traveled up the South Fork-Rogue drainage and over the summit to Fourmile Lake, then continued to Pelican Ranger Station on Upper Klamath Lake. Some of this "first Forest Service road" is closely paralleled or overlain by sections of today's Forest Service Roads 3775 and 37. The abandoned "Red Lake Trail," in Sky Lakes Wilderness follows it as well. Little more than a pack-trail, the Prospect-Fourmile Lake route had brush-clearing limits just wide enough, and stumps cut just low enough, to permit supply wagons to cross the Cascades during fire season.

In 1910 Forest Service crews repaired and widened portions of the old Crater Lake Road and John Day Trail to facilitate travel by wagons and by automobiles; this work was soon taken over by Oregon's state highway department, which remained responsible for construction and maintenance in subsequent decades. The 1910 Cat Hill Fire and resulting erosion on steep slopes permanently ended wagon use of the by-then rarely traveled Rancheria Trail.

With the purchase of automobiles and trucks before World War One, the Forest Service began planning for "truck roads" into the more gentle terrain of the southern Cascade Range. The first such road, built from Butte Falls to Lodgepole Guard Station by about 1916 (present FS Road 34), was extended on northeast to Imnaha Guard Station in 1927 (present FS Roads 34 and 37).

Other important low-standard truck roads built by the Forest Service during the 1920s extended from Crater Lake Highway west to Woodruff Meadows (present FS Road 68), from Butte Falls southeast to Big Elk Guard Station (present FS Road 37), and from Big Elk G.S. southward along the "Big Elk Trail" (present FS Road 37) to Dead Indian Memorial Highway and on south to Moon Prairie Guard Station (east of present-day Howard Prairie Reservoir).

Heavy equipment (some of it powered by steam) as well as advances in road-construction engineering enabled roads to begin penetrating previously "inaccessible" areas. Probably the most challenging Forest Service road project of the late 1920s was the "Fish Lake-Lake of the Woods" Road, built up the deep North Fork-Little Butte Creek canyon to Fish Lake and on over the Cascade summit's daunting Brown Mountain lava field to Lake of the Woods. In the early 1960s, the newly constructed "Winnemucca-to-the-Sea" Highway, Oregon Highway 140, very closely paralleled this route. East of Butte Falls during the 1920s, railroad-logging grades extended into the upper Fourbit Creek drainage. In later years, long after the rails and ties had been pulled up, a few of these railroad grades became Forest Service system roads but most of them were simply abandoned.

President Franklin D. Roosevelt's "New Deal"---his administration's response to the Great Depression of the 1930s---brought an infusion of road-building funds and greatly enlarged work crews to the area. To house a much-expanded Forest Service road crew and its fleet of equipment, the young men of the Civilian Conservation Corps (CCC) built a large warehouse compound on McAndrews Road, in Medford.

The CCC helped build many miles of Forest Service road system in the Cascade portion of the Rogue River National Forest. The main objective of these roads was to provide improved fire fighting and eventual timber-harvest access. Among the more significant "CCC-built" roads west of the Rogue River were the Rogue-Umpqua Divide road from Elkhorn Peak to Abbott Butte (present UNF FS Roads 2925 and 2925-800), the Elk Creek Road (present FS Road 6610), the Buzzard Mine/Buck Basin/Woodruff Bridge Road (portions of present FS Roads 66, 6470-300, and 6470), and the Hershberger Lookout Road (portions of FS Roads 6510 and 6515). East of the Rogue, accessing the broad summit of Huckleberry Mountain, the CCC built today's FS Road 60. Further south they completed and improved the entire length of what is today's FS Road 37 between Prospect and Dead Indian Memorial Highway.

Other tributary routes built during the 1930s include the Blue Rock Road (FS Road 3770), what is today the southern section of FS Road 3260, between Timberline Creek and Deception Creek, and the "Robinson Prairie" Road (FS Road 3730), which connects Big Elk Guard Station with the South Fork-Little Butte Creek canyon by means of a steep section of many switchbacks. Most of these roads remained dirt surfaced until the 1940s-50s.

World War Two and the post-War economic boom witnessed the first large-scale, sustained logging of National Forest timber in the southern Cascades. It was during the late 1940s through the early 1960s that Forest Service timber-haul roads reached up into most of the remaining major drainages of the area.

Some of the more important of these include: Flat Creek (FS Roads 6510 and 6515), Foster Creek (FS Roads 6520 and 6540), Crater Creek/Copeland Creek (FS Roads 6525 and 6525-900), Bybee Creek (FS Road 200), portions of lower Union Creek (FS Road 6050), Mill Creek/Gingko Creek (FS Road 6215), upper Red Blanket Creek (FS Road 6205), lower South Fork-Rogue (portions of FS Road 3775), south rim of the lower Middle Fork-Rogue canyon (FS Road 3790), summit of Rustler Peak (FS Road 640), the headwaters of Rancheria Creek to the west of Rustler Peak (FS Road 3450-200), the gentle-gradient headwaters of the South Fork-Little Butte Creek (FS Roads 3705 and 3720), and Big Draw Creek (FS Road 2590). The last large section of the Cascade area to be "thoroughly roaded" during the post-War era was the upper Elk Creek drainage, where the 1962 Columbus Day windstorm felled millions of board feet of timber, which soon was accessed by an expanded network of roads into this very steep terrain.

Much of the 1940s-1960s timber harvest in the Cascades was accomplished by tractor logging. By the 1970s, however, more advanced skyline-cable systems permitted full-suspension logging across long distances and over very steep slopes. Roads built specifically for setting up skyline yarders (with the loads of logs hauled back down the roads to the mill by fleets of high-powered trucks) ascended into some of the previously most remote and inaccessible stands of timber. Roading of this type increased throughout the period of intensive timber management and high harvest volumes of the 1970s and 1980s. The Forest's road system grew from approximately 1,000 miles in the late 1960s to over 3,000 miles by the late 1980s. The present-day Forest Service road system in the Cascades portion of the Rogue River National Forest, which includes an approximate total of 1,800 miles, was essentially complete by 1985-1990.

(The information in this section is drawn largely from the following sources: *Prehistory and History of the Rogue River National Forest: A Cultural Resource Overview* [LaLande 1980], *History of the Rogue River National Forest*, Vol. I and II [Brown 1960 and 1971], and various *Crater/Rogue River National Forest maps*, 1910-1987.)

B. Current Situation

1. Road Density

Road density, as displayed in Map II-2, shows the approximate number of miles of classified road per square mile of land area. Classified roads are those roads needed for long-term motor vehicle access including State roads, county roads, private roads, National Forest System roads, and other roads authorized by the Forest Service. This map does not calculate non-Forest Service roads in density scales.

Unclassified roads, such as an unplanned road, an abandoned travel way, an off-road vehicle track not designated and managed as a trail, or roads that were once under permit or other authorization, but not decommissioned at the end of the authorization, are not managed as part of the forest transportation system. The unmapped unclassified roads may or may not have associated environmental concerns. Forest transportation managers estimate that there are approximately 110 additional miles of unclassified roads above the classified road system.

2. Road Statistics

There are currently 2,550 miles of Forest Service classified roads in the Rogue River National Forest transportation system. The Cascade Area Roads Analysis encompasses 1,826 miles of Forest Service classified roads, or 72 percent of the entire Forest transportation system. Within the analysis area, 70 percent of the Forest Service roads are currently open to vehicle traffic.

Table II-1. Total Miles of Roads By Maintenance Levels and Surfacing Types Within Cascade Mountains Analysis Area

Maintenance Level	Surfacing Type	Miles	% of Total Miles
1. Closed Road	Native	357	
	Improved	45	
	Aggregate	149	
Totals		551	30
2. High Clearance Vehicle	Native	159	
	Improved	111	
	Aggregate	677	
	Asphalt	07	
Totals		954	52
3. Passenger Car, Low	Native	01	
User Comfort	Improved	00	
	Aggregate	223	
	Asphalt	09	
Totals		233	13
4. Passenger Car, Moderate	Native	00	
User Comfort	Improved	00	
	Aggregate	20	
	Asphalt	67	
	Bituminous	02	
Totals		89	05
Surfacing Totals		1,826	100

(See glossary for definitions of maintenance levels)
Improved = Surfaced with either pit run or cinder materials.

MAP II-2. Road Density - Cascade Mountains Area

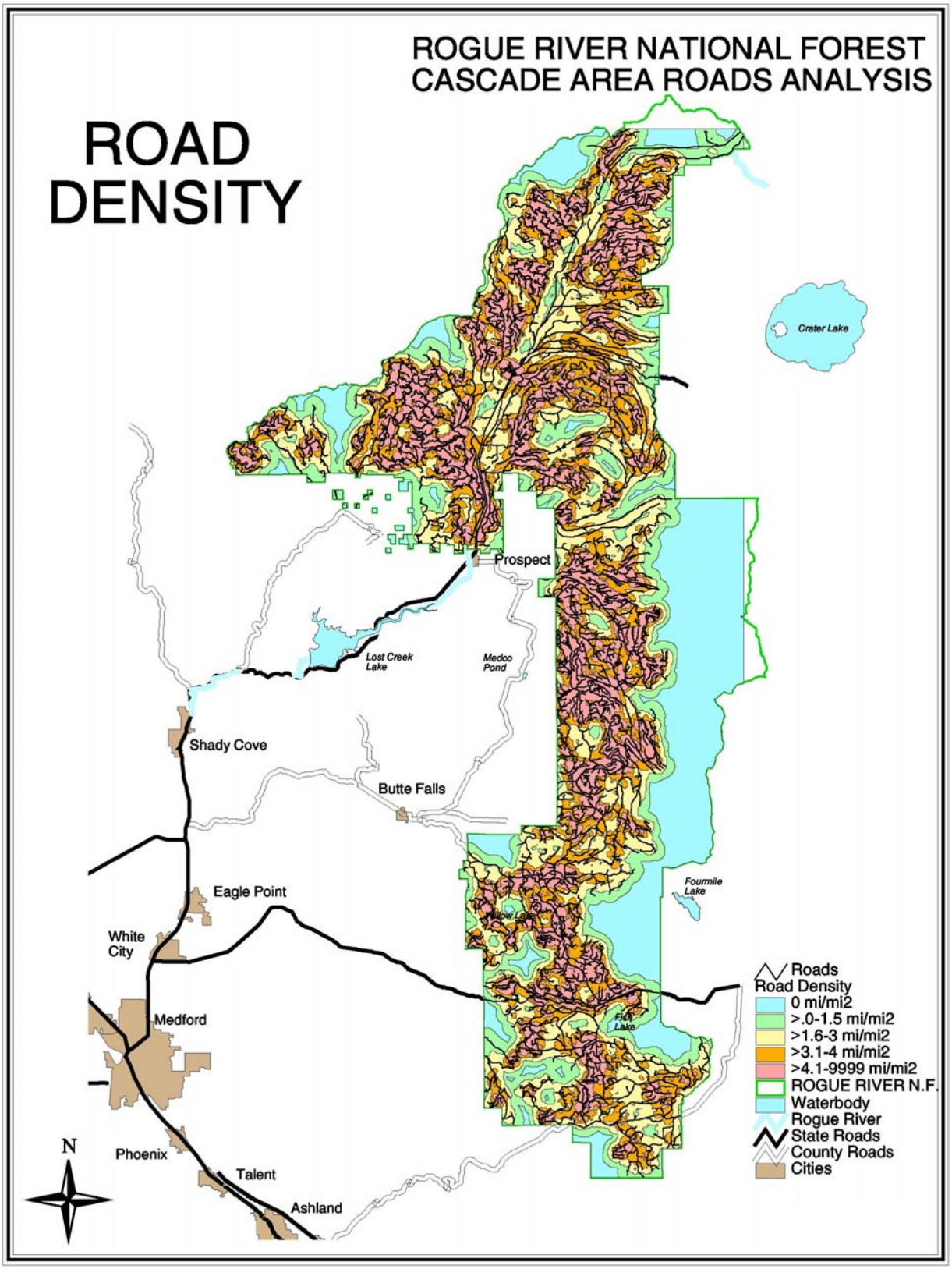


Table II-2. Surfacing Summary Within Cascade Mountains Analysis Area

Surfacing Type	Total Miles
Native	517
Improved	156
Aggregate	1,068
Asphalt	83
Bituminous	02
Total Miles	1,826

3. Existing Uses

The current road uses in the Cascade Area fall under three general terms:

- **Commercial** - Usually non-Forest Service employees conducting commerce activities, such as delivering goods and services in, adjacent to, or out of the National Forest
- **Recreation** – Typically people who use Forest Service roads to access and use trails, campsites, interpretive sites, heritage sites, waterways, dams, etc.
- **Administrative** - Forest Service or other agency employees acting in official capacity conducting day-to-day work activities

Commercial - A dramatic reduction in the National Forest timber harvest program created by the change in land allocations associated with the Northwest Forest Plan has reduced the need for timber-associated traffic; however other commercial ventures associated with the forest resources exist in the gathering of special forest products. These ventures include but are not limited to firewood cutting, herb gathering, mushroom gathering, Christmas tree and bough harvesting, and transplants.

Livestock permitees release their cattle to the forest open range in the spring, and gather them back to haul them to lower pastures in the fall, perpetrating a long-standing commercial venture between the Forest Service and local cattlemen.

The Town of Butte Falls and the Town of Prospect, although not directly related commercially to the forest resources, rely on people stopping in town for necessities before making their way in to the forest for work or play.

Recreation - Trails within the Cascade Roads Analysis Area are widely used. The Butte Falls Ranger District is the gateway to the Sky Lakes Wilderness, and the Prospect Ranger District allows access to the Rogue Umpqua Divide Wilderness. Ashland Ranger District administrates the multiple use trails along Highway 140 in the Fish Lake area.

Vehicles using forest roads access trailheads. Trail user groups include hikers, equestrians, mountain bikers, and off-highway vehicle riders (OHV). Winter trail users consist of Nordic, snowmobile, and OHV.

Sno-Parks are available in Prospect, Butte Falls and the Ashland part of this Roads Analysis Area, and provide a combination of downhill skiing, snowboarding, cross-country skiing, snowmobiling and snow play.

Camping in developed campsites is popular and campgrounds are often at peak levels during the season. There are also several developed picnic areas available for day-use activities. Whiskey Springs interpretive trail is a high-use trail in Butte Falls, and Prospect has Natural Bridge and The Rogue River Gorge, two high-use interpretive sites.

There are many dispersed campsites available, which consist of undeveloped campsites accessed by vehicle, usually brought about by dispersed features scenic in nature.

Lake camping opportunities, providing water-skiing, swimming, boating, and fishing exist within the Analysis Area at Willow Lake and Fish Lake.

There are two designated auto tours that pass through this part of the Cascades. The first is the Rogue-Umpqua National and State Scenic Byway. This high-use tour travels through the Prospect Ranger District utilizing State Highways 62 and 230. The second is the Butte Falls Discovery Loop Tour, which begins and ends in the town of Butte Falls, and travels through the Butte Falls Ranger District utilizing several Forest roads.

There are some casual uses of this area, and though not entirely recreational in nature, they are not wholly commercial either. These are the casual mushroom picker, berry picker, and hunter and fisherman. This area is extensively hunted and fished through every available season.

Administrative - The agencies responsible for administration of lands and resources within the Cascade Roads Analysis Area include but may not be limited to:

- The Forest Service
- The Bureau of Land Management
- The Medford Water Commission
- Oregon Department of Fish and Wildlife
- Oregon Department of Forestry

There are myriad responsibilities associated with managing land, water, fish and wildlife. Each job requirement at the field level requires access to the transportation system to different degrees.

C. Issues and Factors

Issues regarding management of the Forest Transportation System are divided between those relating to potential or actual environmental harm (**environmental costs**), and those issues relating to the ways roads are utilized (**road benefits**). These issues and subparts (factors) of these issues are described here.

1. Environmental Costs

a. Aquatic Environment

The factors identified as aquatic environmental costs for the Cascade Mountains Roads Analysis Area are:

- Large Wood
- Sediment
- Listed and Sensitive Fish Passage
- Key Watershed

Large Wood, Sediment and Fish Passage, are issues where the road system may directly affect fish habitat and connectivity of fish habitat. Roads and stream crossings may change processes whereby wood and sediment reach streams and change fish migration patterns. Roads paralleling or bisecting stream channels and adjacent riparian zones occupy space where trees once grew. Most large wood is delivered to the stream network by directly falling in to a stream channel, or by being transported from a distance by a landslide. It then either remains in that specific location or is transported downstream. The contribution zone for trees is principally within one tree height of a stream channel in the stream network, or from an area prone to slope failure that delivers large wood to a stream channel.

Sediment inputs transported from roads to stream channels can be chronic over an extended period of time or episodic during flood events or landslides. Sediment may also be transported to streams from sheet, rill, and gully erosion, especially in soils of the Western Cascades Province. High Cascades materials are generally more resistant to erosion and landslides, with the exception of the steep pumice canyons in some of the central and eastern portions of the Prospect Ranger District. Road fill failures deliver primarily coarse and fine sediment without wood, and often in large pulses, in to local stream channels. Inordinately large pulses of sediment entering a stream network can overwhelm the ability of the channel to route sediment through the stream system, causing planar streambed features with little habitat diversity. The effects of large and local pulses of sediment, primarily from large debris flows, severe erosion, and/or earth flow landslides, are well documented. These include but are not limited to: stream substrate interstitial filling, channel widening, simplification of habitat used by fish, pool filling, loss of oxygenated water flow to fish eggs, fry incubating in gravel nests, and decreases in stream habitat used by aquatic insects (benthos community).

Secondary results include increased exposure of the water surface to solar radiation, subsequent increases in summer water temperatures, and general loss of macro and microhabitat surface area with an overall loss of aquatic productivity.

In a forested environment, large wood and sediment, delivered by tributary channel transport, direct entry from riparian zones, and side-slope landslides, are often delivered simultaneously to influence fish habitat. The consequence is that diverse stream substrate sizes are sorted, habitat units are created (pools, riffles), depositional bars form, floodplains with diverse topography are built, and other influences on aquatic and riparian habitat occur.

1) Large Wood

For the Large Wood factor, the portion of each road segment that is within one site tree height, 156 feet, of the stream was calculated using the Geographical Information System (GIS). To compare and normalize between sub-watersheds, the total length of roads within this one site tree height distance was divided by the total length of the stream network on the stream layer in GIS. The sub-watershed percentages of roads within riparian zones are twice the net percentage value because of detection by GIS if the road is near either side of the stream. There is twice the length of riparian zones adjacent to streams as there is adjacent stream length. For all sub-watershed assessments, the range of values was divided by three to develop a Low, Medium, High value for comparing relative environmental impacts to streams within sub-watershed in the Cascade Roads Analysis Area. The assigned Low, Medium, and High scores are relative; used here only to compare sub-watersheds in the analysis area. A percentage of roads within two site trees of stream channels was used to assess road impacts on wildlife travel corridors.

Stream Network with Roads Within One Site Tree Height

Individual Road Segments
Low 0 - 0.1 miles of the road segment within one site tree of a stream channel
Medium > 0.1 – 0.25 miles of the road segment within one site tree of a stream channel
High > 0.25 miles of the road segment within one site tree of a stream channel

Percent of Sub-watershed Stream Network with Roads Within One Site Tree Height

Sub -Watershed Ratings (6^{th} Field HUC)
Low <14% of the stream system has roads located in the riparian reserve
Medium 14 % – 31% of the stream system has roads located in the riparian reserve
High >31% of the stream system has roads located in the riparian reserve

2) Sediment

Cumulative effects and exponential increases in sediment delivery can occur where roads impact a single stream channel in several locations along the stream profile.
For the Sediment Factor, the rating systems used to assess the environmental cost of excess sediment entering the stream system are:

Percent of Sub-watershed Stream Network with Roads Within One Site Tree Height. (same as for large wood)

Sub-Watershed Ratings
Low <14% of the stream system has roads located in the riparian reserve
Medium 14 % – 31% of the stream system has roads located in the riparian reserve
High >31% of the stream system has roads located in the riparian reserve

The Number of Road Crossings Per Mile of Stream Within the Sub-Watershed.

Individual Road Segment Ratings:
Low 0 – 2 road crossings
Medium 3 – 4 road crossings
High > 4 road crossings

Sub-Watershed Ratings for Stream Crossing Assessment:
Low 0-1 road crossings per mile of stream
Medium 1-3 road crossings per mile of stream
High >3 road crossings per mile of stream

Modified Soil Resource Inventory (SRI) – A system was evolved in 1981 for the Rogue River Land Resource Management Plan (LRMP), which allows the SRI to be used in conjunction with slope stability information. The landslide activity and type map was combined with the geology and landslide hazard map. These four layers together created the Modified SRI/Stability Map.

High Landslide Hazards are defined as active or potentially active earth flows, slumps, translational, and debris flow landslides. These features are considered the highest risk terrain, which includes very steep slopes (70% and greater), active or potentially active landslides, and over-steepened creek banks. Severely eroded terrain and wetland areas are also included in this classification system. High Landslide Hazards are classified as unsuitable for land management on Rogue River National Forest lands. Road segments within High Landslide Hazards are of concern within each sub-watershed, especially where road segments contain more than 0.4 miles of High Landslide Hazards. The following are the ratings for landslide and surface erosion concerns.

The Number of Miles of Road in Areas of High Landslide Hazard Designation in the Sub-Watershed.

Ratings by Sub-Watershed:
Low 0-0.2 miles of road within High Landslide Hazards
Medium 0.2-0.4 miles of road within High Landslide Hazards
High >0.4 miles of road within High Landslide Hazards

Note: High Landslide Hazards, and high road densities layers are combined to show the differences between the two-geophysiographic provinces (i.e. that the Western Cascades contain earthflow landslides even in gentle terrain, whereas most of the High Cascades Province only has landslides/severe erosion on steep slopes).

3) Listed and Sensitive Fish Passage

Fish passage and migration are affected by stream crossing structures in the road system. Bridges and natural bottom structures have little or no effect on the migration of fish upstream and downstream, however culverts or other structures used to support the road facility over the stream can interrupt fish movement in a watershed by introducing prohibitive jump heights into the pipe, and water velocities within the pipe that are too high for fish to successfully swim. These situations present impediments to juvenile and adult migrating fish moving upstream. Connectivity of aquatic habitat is paramount for fish to retain the ability to migrate to: stream habitat with more favorable spawning conditions, areas with optimum water temperatures, and stream reaches with preferred aquatic habitat features, (e.g. deep pools and adequate hiding cover).

Listed and sensitive fish species are fish species of concern that are listed under the Endangered Species Act (ESA) or identified on the Pacific Northwest Region (Region 6) Sensitive Species list. Coho salmon (*Oncorhynchus kisutch*) and occupied and potential Coho salmon habitat (Critical Habitat) are listed as threatened under the ESA. Coastal cutthroat trout (*Onchorynchus clarki*) are on the Region 6, Regional Forester's Sensitive Species List.

Cutthroat trout are present in most headwater streams in the Cascade Roads Analysis Area. Stream crossings of fish bearing streams within this analysis, is equivalent to stream crossings with listed or sensitive fish species.

The presence of road crossings in streams containing Coho salmon, Coho salmon critical habitat, or coastal cutthroat trout within a sub-watershed per road segment.

Low - 0 road crossings in Coho salmon or cutthroat trout streams
Medium - 1-2 road crossings in Coho salmon or cutthroat trout streams
High - >2 road crossings in Coho salmon or cutthroat trout streams

4) Key Watershed

The Key Watershed designation is part of the Aquatic Conservation Strategy in the Northwest Forest Plan (NWFP). These watersheds or sub-watersheds were designated by scientists who drafted the NWFP as core areas of habitat integral to recovering depressed salmon and steelhead populations on federally managed lands.

Two designated Key Watersheds are within the area of the Cascade Roads Analysis: Elk and Little Butte Creek Watersheds.

The road system within a Key Watershed is of special concern. Under the Aquatic Conservation Strategy of the Northwest Forest Plan, a guideline of no net increase in the total miles of road within these watersheds is stated with an emphasis placed on reducing the miles of road in areas with high erosion and sediment delivery potential.

The rating system applied to Key Watersheds for the sake of Roads Analysis

Low – A watershed or sub-watershed is not designated as a Key Watershed in the NWFP
High - A Key Watershed
There is no "Medium" rating for this factor.

b. Terrestrial Wildlife Environment

The factors identified as wildlife environmental costs within the Cascade Mountains Roads Analysis Area are:

- Late Successional Fragmentation
- Travel Migration Corridors
- Big Game Harassment
- Threatened, Endangered and Sensitive Species

These factors describe where and how the road system may directly affect wildlife and wildlife habitat.

1) Late Successional Fragmentation

Over 1,100 terrestrial species have been determined to be closely associated with late-successional and old growth forests, including the northern spotted owl, great gray owl, red tree vole, bats, salamanders, and numerous mollusk and botanical species. These natural populations are affected by habitat fragmentation caused by the presence of roads, which change the landscape structure. Roads fragment habitat by dissecting vegetation patches, and increasing the edge-affected area, thereby decreasing interior habitat. Forest fragmentation eliminates blocks of continuous habitat, or degrades the quality of remaining habitat for those species sensitive to an increase in the amount of forest edge. During the daytime, forest edges typically have lower humidity; higher air temperatures, higher soil temperatures and lower soil moisture, increased solar radiation, and higher wind speeds than interior forests. Edge effects manifest themselves in several ways. Birds' nests show an increase of parasites and nest depredation. Amphibian distributions change, as well as plant distributions and abundance. Noise from vehicle traffic degrades habitat for birds, and big game such as deer and elk. Snag removal along Forest Service roads to ensure safety for the public and employees, has an effect on bats and cavity nester species that require dead trees for forage and nesting.

Physical edge effects from general forest roads commonly extend up to 120 meters. (131.2 yards) To measure the fragmentation costs, Mature Habitat and Old Growth stands (MH and OG from the GIS vegetation layer) were buffered 120 meters inside the perimeter of each stand. They were then intersected with the road layer.

Fragmentation cost ratings

Low – Road segment did not fall within the buffered area or the interior habitat section
Medium – Road segment fell within the 120 meter buffered area
High – Road segment passed through the interior habitat section

2) Travel/Migration Corridors

Riparian Reserves serve as key travel corridors for many species because the three essential survival elements are found there: food, shelter, and water. The riparian corridors are generally intact, and offer continuous canopy cover which moderates the extremes in conditions found outside the reserves.

Riparian Reserves are viewed as reservoirs of the natural environment branching through stands of managed forests. This connected habitat between late successional stands is used to travel to and from summer and winter ranges, and between feeding, breeding, brooding, and rearing habitats. Intersection of reserves by roads dissects the travel corridors and may have adverse affects on many species. As deer and elk migrate from their summer range to the wintering grounds, well-defined migration trails intersect forest roads, and increased road kills occur. Small, slowly moving migratory animals such as amphibians are highly vulnerable as they cross even narrow forest roads.

Birds are attracted to roads to hunt for small mammals, or to feed on grains and seeds along roadsides, resulting in mortality from vehicle collisions. Reptiles seek roads for thermal cooling and heating, which also increases mortality rate from vehicles. Forest carnivores such as coyote, bobcat and cougar, are vulnerable to road mortality because they have large home ranges that often include road crossings. Many species avoid roads. When this happens, animals remain at some distance from roads and rarely or never attempt to cross. The roads then become barriers to movement causing the fragment of large continuous populations in to smaller subpopulations. When populations become subdivided, there is increased risk of demographic fluctuation, local extinction of subpopulations, less re-colonization after local extinction, and a progressive loss of local biodiversity. As road width and traffic density increase, roads become more effective barriers. This factor intersected the road layer with the Riparian Reserve layer.

Travel Corridor cost ratings

Low – Road segment did not enter the Riparian Reserve
Medium – Road segment ran parallel to a stream within the Riparian Reserve, but did not cross the stream.
High – Road segment dissected the Riparian Reserve and crossed the stream, completely fragmenting the travel corridor.

3) Big Game Harassment

Big game species such as deer and elk are sensitive to harassment or human presence, which is facilitated when roads are introduced in to a closed forest environment. Reductions in productivity, increases in energy expenditures, and displacements in population distribution or habitat use can occur.

An example is avoidance by elk of large areas near roads open to traffic, with avoidance increasing as rate of traffic increases. Increases of energy expenditures in late fall and winter can lead to potential reductions in productivity. Thus, open road density in big game wintering grounds has a direct affect on big game populations.

The road density in Management Strategy 14 in the RRNF Forest Plan, (Big Game Winter Range) rates potential impact to big game. Standards and Guidelines from the RRNF Forest Plan calling for limiting the number of open roads to approximately 1.5 miles per square mile of land were used to determine big game harassment costs. This factor intersected big game winter range with the road layer.

Big Game Harassment cost ratings

Low – Road densities fall within 0 to 1.5 miles per square mile of land
Medium – Road densities range from 1.5 to 3.0 miles per square miles of land
High – Road densities are above 3.0

4) Threatened, Endangered and Sensitive Species

Peregrine falcons, northern spotted owls, and bald eagles can be adversely affected by disturbance due to road presence. Peregrine falcons are particularly sensitive to their surroundings during the nesting season, and will sometimes abandon the nest of eggs or young because of disturbance, allowing predator access to the nest and resulting in nesting failure. Northern spotted owls show effect from activities on roads within ¼ mile of nest groves. Bald eagles may be impacted by road activities within ½ mile of an active nest site. Long-term road management within the Bald Eagle Management Areas may also have an affect on reproductive success of the bald eagle. In summary, no terrestrial vertebrate taxa appear immune to the myriad of road-associated factors that can degrade habitat or increase mortality. These multifaceted effects have strong management implications for landscapes characterized by moderate to high densities of roads. In such landscapes, habitats are likely underused by species sensitive to road activities. Moderate or high densities of roads sometimes index areas that function as population sinks; that would otherwise function as source environments if road density was low or zero.

The following rates the impacts to peregrine falcon, northern spotted owl, and bald eagles from habitat that may be associated with disturbance due to road presence.

For the peregrine falcon, the road layer was intersected with the primary and secondary nest protection zones. Environmental costs were determined as follows:

Low – Road segment fell outside of either zone
Medium – Road segment fell within the secondary nest protection zone
High – Road segment fell within the primary nest protection zone

For the northern spotted owl, the road layer was intersected with a ¼ mile buffer around known nest sites or activity centers. Environmental costs were determined as follows:

Low – Road segment fell outside the buffer
High – Road segment fell within the ¼ mile buffer
No "Medium" rating occurred for this process.

For the bald eagle, the road layer was intersected with the Bald Eagle Management Area (BEMA) for each known site. Very few road segments fell within the designated management areas, as the area of influence was generally close to water, or on lands not administered by the Forest Service. Environmental costs were determined as follows:

Low - Road segment fell outside the BEMA
High – Road segment fell inside the BEMA
No "Medium" rating occurred for this process.

2. Road Benefits

a. Recreation

Access to recreation sites is a critical component in providing a "quality" recreation experience for forest visitors. This Roads Analysis project will address the access needs for recreation sites based on a "sense of demand" for a particular site through its level of occupancy or use. For example, a recreation site that receives high occupancy or use reflects a higher demand for that site and for its associated road access routes. In contrast, a recreation site that receives low occupancy or use reflects a lower demand for that site and its associated road access routes. Recreation personnel derived the occupancy/use levels for a particular site from periodic patrols within the peak recreation season, (Memorial Day through Labor Day) at which time the number of sites occupied or number of visitors were recorded, or by the number of registration cards/fee envelopes counted.

The following access benefit factors and their levels of occupancy/use (as defined by the Rogue River National Forests *Land and Resource Management Plan,* 1990) are rated low, medium, or high.

- Developed Recreation Sites
- Dispersed Recreation Sites
- Trailheads

1) Developed Recreation Sites

A developed recreation site is one that contains facilities (toilets, tables, etc.), and in turn, results in the concentrated use of an area. There are twenty-five developed recreation sites that have been identified within the Cascade Roads Analysis Area. This includes one amphitheater, fourteen campgrounds, three interpretive sites, three picnic areas, two sno-parks, and two shelters.

The level of use for developed recreation sites to rate access benefit is defined as:

Low – Sites near capacity on weekends (80% occupancy or higher)
Medium – Exceeds capacity on holidays, near capacity on weekends
High – Exceeds capacity on holidays and weekends (100% occupancy or higher)

2) Dispersed Recreation Sites

A dispersed recreation site is one found within the general forest area and does not have any facilities associated with it. There are two hundred twenty-six dispersed recreation sites within the Cascade Roads Analysis Area. These sites include traditional vehicle camping sites, and features that are points of interest like falls, springs, or rock outcroppings.

The level of use for dispersed recreation sites to rate access benefit is defined as:

Low – 50 visits or less (visit equals one person at one time)
Medium – 51 to 150 visits
High – 151 visits or more

3) Trailheads

A trailhead is a facility designed primarily for parking and provides access to a trail for purposes of travel by foot, stock, mechanized or motorized trail vehicle (less than 50" in width). There are fifty-five trailheads within the Cascade Roads Analysis Area.

The level of use for trailheads to rate access benefits is defined as:

Low – 50 visits or less (visit equals one person at one time)
Medium – 51 to 150 visits
High – 151 visits or more

b. Fire Protection and Suppression

Fire Management uses the current transportation system to access land base for hazard reduction projects, and to suppress wildfires. The major factors representing access benefits for fire management are:

- Hazard and Occurrence
- Accessing Fire Facilities

1) Hazard and Occurrence

High hazard areas are those that would exhibit catastrophic fire behavior. They are generally located in steep terrain with heavy fuels where fire behavior can be extreme. Rapid access and aggressive suppression action is necessary to limit property and resource loss.

For fire suppression efforts to remain effective and timely in high hazard areas, extensive access is needed. Some primary roads in high hazard areas, possibly not important for recreation or silviculture needs, may make the difference in initial attack efforts in a fire situation. Primary roads, usually maintenance level 2 (see glossary), which access the bottom of the slope, provide the safest place to initial attack a fire. Roads accessing the top of the slope are where crews can be stationed to work to stop a fire. Because fire is unpredictable, it is difficult to rate one road over another.

Zones of Fire Occurrence Blocks were developed based on historical fire location data recorded from the years 1960 through 2000. This information is readily available on maps from the Geographic Information System. Lines were drawn around the occurrence blocks using ocular estimates, and zones were categorized by fire occurrence density as high, medium or low. High occurrence areas received a high rating for access needs, followed by medium and low ratings for corresponding fire occurrence areas.

To rate access needs for hazard areas and fire occurrence, hazard areas were overlaid on to fire occurrence areas using GIS. The following reflects the results:

Hazard + Occurrence = Access Need

Low Hazard + Low Occurrence = L
Low Hazard + Medium Occurrence = L
Low Hazard + High Occurrence = M

Medium Hazard + Low Occurrence = L
Medium Hazard + Medium Occurrence = M
Medium Hazard + High Occurrence = H

High Hazard + Low Occurrence = M
High Hazard + Medium Occurrence = H
High Hazard + High Occurrence = H

2) Fire Facilities

The following fire protection and suppression related facilities are located in the Cascade Roads Analysis Area, and are an integral part of the fire program. Access needs ratings are reflected based on the importance of each facility to support an effective fire program. There is one rating for each facility, or group of like facilities.
Access ratings are:

Medium – Historical viewpoints used for detection (Twin Ponds Trailhead, Oak Mountain, Skeeters Point, Hammaker Bluff, Red Blanket Mountain, Bessie Rock)
High - Developed pump shows, heliponds, and water resources
High – Permanent Lookouts
High – Emergency lookout locations. (Hershberger, Buck Point, Stella)
High – Helispots

c. Vegetation Management

The issues within the Cascade Area Roads Analysis pertain to silviculture, and concern for road accessibility to forest stands for accomplishing silvicultural treatments. The following strategy was developed for prioritizing access for silviculture for the sake of this analysis.

1) Matrix Lands

Matrix lands, land allocations capable of supplying programmed timber harvest, are considered higher priority for ease of access for pre and post-sale activities than non-Matrix lands, except where *Late-Successional Reserve (LSR) Priorities for the RRNF* identify high priority areas for silviculture/fuels treatments in LSRs.

Matrix lands are identified by the following management strategies (MS) located in the RRNF forest plan:

MS 6 - Foreground Retention	MS 7 – Foreground Partial Retention
MS 8 - Middleground Retention	MS 9 – Middleground Partial Retention
MS 14 - Big Game Winter Range	MS 20 – Timber Suitable 1
MS 21 – Timber Suitable 2	MS 23 – Managed Watershed

The vegetation condition class GIS layer example below was used for identifying opportunities for potential treatment areas within Matrix lands.

PT= Poles thinning opportunity	MT= Small saw thinning opportunity
MM= Mature	NS= Non-stocked (including failed plantations)
SO= Sapling stocked (1-4.9" dbh)	SL= Sapling low stocking (1-4.9" dbh)
SH= Shelterwood	
MH= Mature habitat	OG= Old Growth
RO= Seedling stocked (<= 1" dbh)	RL= Seedling low stocking
PN= Poles no thinning opportunity	MN= Small saw no thinning opportunity
RR= Range opportunity	NF= Non-forest
WW= Water	OT= Other

Within this Roads Analysis, condition class reflects treatment. The following access needs ratings reveal:

Low - PN, MN, RR, NF, WW, OT condition class
Medium - MH, OG, RO, RL condition class
High - PT, MT, MM, NS, SO, SL, SH condition class

2) Late-Successional Reserve Lands (LSR)

LSR access needs for silvicultural activities are based on a previous LSR assessment: *LSR PRIORITIES Rogue River NF (recommendations)*. Maps showing priority areas within the LSR are available in the Rogue River National Forest Geographical Information System.

Silvicultural activities in the LSRs are for fire risk reduction and enhancing Late-Successional habitat. Priorities are as follows:

Low - All other LSRs not included below
Medium – Areas within LSR 222 (expansion and connection), LSR 227 (enhance late seral conditions), LSR 226 (enhancing and connecting late seral blocks), LSR 225(enhancing and connecting late seral blocks).
High – Areas within LSR 222 (fire risk reduction), LSR 227 (fire risk reduction)

d. Cost Share Roads

Existing or terminated Cost Share Agreement Areas contain high value transportation systems mutually needed by the Forest Service and private landowners. Such roads provide a shared easement for both parties; they are a joint-shared road system.

The Forest Service has granted to the Cooperator a private interest right in the use of the Forest Roads they share. Cost share cooperators retain the rights to use the roads across their lands, but these roads are under the jurisdiction of the Forest Service.

Forest Service Roads that are included in cost share agreements or shared easements (See Appendix D – Additional Road Management Analysis Factors) should have a High rating for access needs.